

O I P E
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App. No. 10/761,972
Amendment dated Aug. 10, 2005
Reply to Office Action of May 10, 2005

Amendments to the Specification:

Please replace paragraph [0001] with the following amended paragraph:

[0001] This application is related to the application of John F. Casey, et al. entitled "Methods for Making Microwave Circuits" (Docket No. 10020707-1 Serial No. 10/600,143, filed June 19, 2003), the application of John F. Casey, et al. entitled "Methods for Forming a Conductor on a Dielectric" (Docket No. 10030748-1 10/601,042, filed June 19, 2003), and the application of John F. Casey, et al. entitled "Methods for Depositing a Thickfilm Dielectric on a Substrate" (Docket No. 10030747-1 10/600,600, filed June 19, 2003). These applications are hereby incorporated by reference for all that they disclose.

Please replace paragraph [0016] with the following amended paragraph:

[0016] FIGS. 2 & 3 illustrate a plurality of quasi-coax transmission lines 200, 202, 204 formed in accordance with the methods disclosed herein. FIG. 2 illustrates the transmission lines 200-204 200, 202, 204 in perspective; and FIG. 3 illustrates the transmission lines 200-204 200, 202, 204 in cross-section.

Please replace paragraph [0019] with the following amended paragraph:

[0019] In one embodiment of the FIG. 3 transmission lines 200-204 200, 202, 204, the ground shield covering the tops and exterior walls 224, 226 226, 228 of the first and second mounds of dielectric 206, 208 is the second ground shield 220. In another embodiment, the ground shield covering the exterior walls 224, 226 226, 228 of the first and second mounds of dielectric 206, 208 is the third ground shield 222, and the ground shield covering the tops of the first and second mounds of dielectric 206, 208 is the third ground shield 222. In other embodiments, the tops and exterior

walls 224, ~~226~~²²⁶ 226, 228 of the first and second mounds of dielectric 206, 208 may be shielded by other means.

Please replace paragraph [0020] with the following amended paragraph:

[0020] Preferably, the first, second and third ground shields ~~218-222~~^{218, 220,} 222 contact one another so as to encapsulate at least some cross-sections of the first and second mounds of dielectric 206, 208 (e.g., as shown in the cross-section illustrated in FIG. 3). However, in some cross-sections of the transmission lines 200-204, the ground shields ~~218-222~~^{218, 220, 222} may not contact one another. For example, breaks in the ground shields ~~218-222~~^{218, 220, 222} may be necessary to aid in routing input and output signals to/from the conductors 210, 212, 216, or to aid in attaching other transmission line structures and/or circuit components to the transmission lines ~~200-204~~^{200, 202, 204}.

Please replace paragraph [0021] with the following amended paragraph:

[0021] By way of example, the dielectrics 206, 208, 214 shown in FIGS. 2 & ~~3~~^{FIG.} 3 may be glass or ceramic dielectrics. In one embodiment, the dielectrics are KQ CL-90-7858 dielectrics (thickfilm glass dielectrics) available from Heraeus Cermalloy (24 Union Hill Road, West Conshohocken, Pennsylvania, USA). The substrate 224 (see FIGS. 2 & 3) may be a 40 mil lapped alumina ceramic substrate with a gold ground shield 218 deposited thereon. Alternatively, the substrate 224 may have a glass, ceramic, polymer, metallic or other composition. If metallic, the substrate 224 itself may serve as the ground shield 218. The conductors 210, 212, 216 and ground shields ~~218-222~~^{218, 220, 222} may be deposited by printing a thickfilm conductive paste, such as [[DuPont®]]DUPONT® QG150, through an appropriate stencil or screen.

Please replace paragraph [0022] with the following amended paragraph:

[0022] FIG. 4 illustrates a first method 400 for forming the shielded transmission lines ~~200-204~~^{200, 202, 204} shown in FIGS. 2 & 3. To begin, first and second lower mounds of dielectric 500, 502 are deposited 402 on a first ground shield 218, as shown in FIG. 5. Conductors 210, 212 are then deposited 404 on each of the first and second lower mounds 500, 502, and first and second upper mounds of dielectric 504, 506 are deposited 406 on the first and second lower mounds of dielectric 500, 502. Thereafter, a second ground shield 220 is deposited 408 over the first and second dielectrics ~~500-506~~^{500, 502, 504, 506}. Referring to FIG. 6, a third lower dielectric 600 is deposited 410 in a valley between the first and second dielectrics ~~500-506~~^{500, 502, 504, 506}, and a conductor 216 is deposited 412 thereon. A third upper dielectric 602 is then deposited 414 on the third lower dielectric ~~508~~⁶⁰⁰, and a third ground shield 222 is deposited 416 over the third upper dielectric 602.

Please replace paragraph [0023] with the following amended paragraph:

[0023] The mounds of dielectric ~~500-506~~^{500, 502, 504, 506}, 600, 602 may be deposited, for example, by using a thickfilm printing process. Some exemplary thickfilm printing processes are disclosed in the patent application of Casey et al. entitled "Methods for Making Microwave Circuits". In accordance with Casey et al.'s methods, each of the dielectrics ~~500-506~~^{500, 502, 504, 506}, 600, 602 may be deposited by printing multiple layers of thickfilm dielectric and then firing the layers. If desired, the upper and/or lower dielectrics ~~500-506~~^{500, 502, 504, 506}, 600, 602 may be ground and polished to adjust their thickness. It may also be desirable to polish the lower dielectrics 500, 502, 600 to provide smoother surfaces for deposition of the conductors 210, 212, 216.

Please replace paragraph [0024] with the following amended paragraph:

[0024] FIG. 7 illustrates a second method 700 for forming the shielded transmission lines ~~200-204~~^{200, 202, 204} shown in FIGS. 2 & 3. To begin, first and second lower mounds of dielectric 800, 802 are deposited 702 on a first ground shield 218, as shown in FIG. 8. Ground shield walls 804, 806, 810, 812 are then deposited 704 on sides of the first and second lower mounds 800, 802. Thereafter, a third lower dielectric 808 is deposited 706 in a valley between the first and second lower mounds of dielectric 800, 802, and conductors 210, 212, 216 are deposited 708 on each of the lower dielectrics 800, 802, 808. Referring to FIG. 9, following deposition of the conductors 210, 212, 216, first and second upper mounds of dielectric 900, 902 are deposited 710 on the first and second lower mounds of dielectric 800, 802. Ground shield caps 904, 906 are then deposited 712 over the first and second upper mounds of dielectric 900, 902. Thereafter, a third upper dielectric 908 is deposited 714 on the third lower dielectric 808, and a second ground shield 222 is deposited 716 over the third upper dielectric 908.

Please replace paragraph [0028] with the following amended paragraph:

[0028] As will be understood by one of ordinary skill in the art, the three transmission lines ~~200-204~~^{200, 202, 204} shown in FIGS. 2 & 3 are illustrative only, and any number of adjacent transmission lines could be formed in a similar fashion.